

The Group of *Stygiotrechus ohtanii* (Coleoptera, Trechinae) from the Kii Peninsula, Central Japan

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Abstract Two new species of the group of *Stygiotrechus ohtanii* are described from the Kii Peninsula in Central Japan, under the names *S. misatonis* ASHIDA et K. KITAYAMA, sp. nov. and *S. itoi* ASHIDA et K. KITAYAMA, sp. nov. The former was found on Mt. Onji-yama in Misato-chô, Wakayama Prefecture, and is the second species of the genus from the south of the Median Tectonic Zone. The latter is the first species from the Ikoma Hills, Osaka Prefecture, and is at present the northernmost species of the *S. ohtanii* group. Additional records of the three known species are also provided.

The trechine genus *Stygiotrechus* consists of endogean, eyeless, short-legged and tiny species, and is generally restricted to the northern side of the Median Tectonic Zone in Central and Western Japan. The members of the genus are divided into the following seven species-groups: *S. ohtanii*, *S. morimotoi*, *S. parvulus*, *S. unidentatus*, *S. esakii*, *S. kubotai*, and *S. pachys* (UENO, 1969, 1970, 1973, 1980). Among these, the group of *S. ohtanii* is distributed in the Kii Peninsula and Shikoku Island. Two species, *S. ohtanii* (UENO, 1969, pp. 490, 491, fig. 5; K. KITAYAMA & ASHIDA, 1999, p. 13, fig. 9; UENO, 2001, p. 241, figs. 4–5) and *S. kadanus* (UENO, 2001, p. 234, figs. 1–3), are known from the Izumi Hills in the northern part of the Kii Peninsula, and one species including two subspecies, *S. satoui satoui* (UENO, 1976, p. 278, figs. 1–4; UENO, 1983, p. 74) and *S. satoui compira* (UENO, 1980, p. 6, figs. 5–6), is from the Sanuki Hills in the northeastern part of Shikoku Island. The Izumis and Sanukis lie on the northern side of the Ki-no-kawa River and the Yoshino-gawa River, respectively, which means that they both are on the north of the Median Tectonic Zone. Exceptionally, *S. nishikawai* (UENO, 1980, p. 3, figs. 2–4) was found from the western edge of the Kii Peninsula, about 35 km south from the estuary of the Ki-no-kawa River. This species is so far the only species of *Stygiotrechus* from the south of the Median Tectonic Zone.

In this paper, we are going to describe two new members of the group of *S.*

ohtanii from the Kii Peninsula. One is the second species from the south of the Median Tectonic Zone and the other is the first species from the Ikoma Hills extending to the north from the eastern end of the Izumis. In addition, we will report several new records of the known species of this group.

The abbreviations used herein are as follows: HW – greatest width of head; PW – greatest width of pronotum; PL – length of pronotum, measured along the mid-line; PA – width of pronotal apex; PB – width of pronotal base; EW – greatest width of elytra; EL – greatest length of elytra; M – arithmetic mean ($n=12$).

Before going further, we thank the following members of the Kansai Trechine Research Group for providing valuable materials: Messrs. Kazue ITÔ, Shun-Ichi YAMASHITA, Yoshihide OKUDA, Takumi SAITÔ, Hiroshi ÔHIRA, Kunihiko KAMADA, Hiromu KAMEZAWA, and the late Mr. Akira KITAYAMA. We wish to express our hearty thanks to Dr. Masahiro KON of the University of Shiga Prefecture for help in taking photographs of scanning electron microscope and Dr. Shun-Ichi UÊNO of the National Science Museum (Nat. Hist.), Tokyo, for kind guidance.

***Stygiotrechus misatonis* ASHIDA et K. KITAYAMA, sp. nov.**

[Japanese name: Misato-mekura-chibigomimushi]

(Figs. 1, 3–4)

Stygiotrechus sp.: ASHIDA, 2000, Checklist of Trechinae from Japan, Kyoto, vers. VIII, p. 24.

Length: 2.40–2.75 mm (from apical margin of clypeus to apices of elytra).

Externally similar to both *S. kadanus* S. UÊNO from Mt. Takamori-yama in Wakayama-shi and *S. nishikawai* S. UÊNO from Gonji-ana Cave/Mine in Kawabe-chô, though different from those species by the shape of aedeagus with ventrally curved apical lobe. Rather closely related to *S. ohtanii* S. UÊNO from Mt. Kongô-zan in Chihaya-akasaka-mura with similar male genital features, though easily discriminated by slenderer and more parallel-sided external body.

Color reddish brown with yellowish brown appendages.

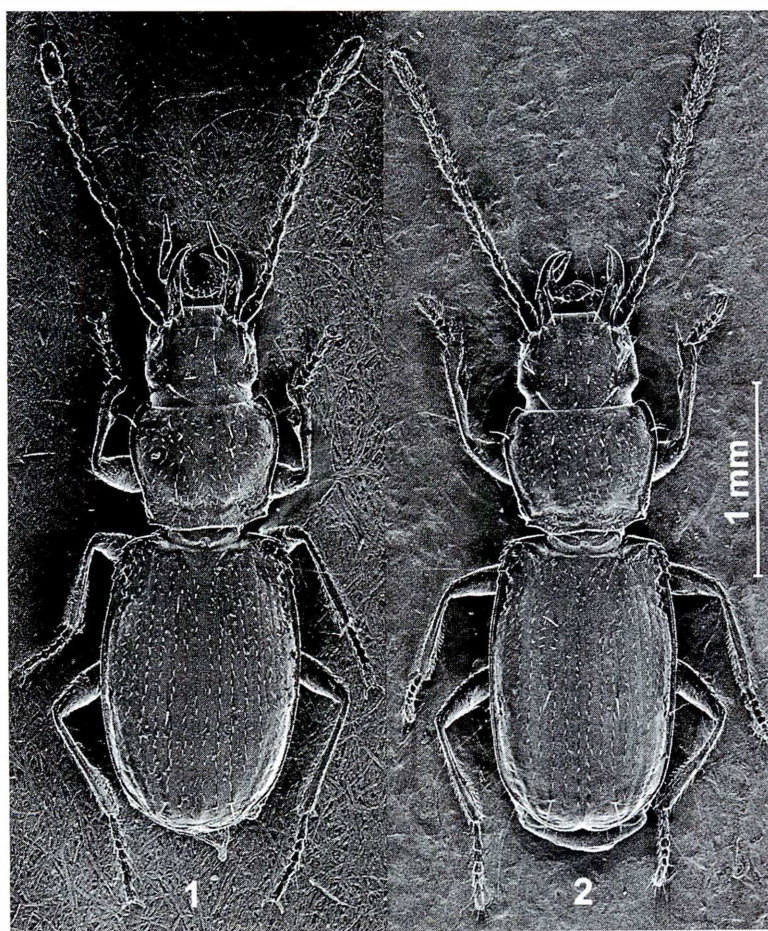
Head as in *S. kadanus* though somewhat larger; genae a little more subangulate at the posterior part; antennae a little stouter.

Pronotum similar to that of *S. ohtanii*, a little wider than in *S. kadanus*, widest at about three-fourths from base; PW/HW 1.22–1.32 (M 1.27), PW/PL 1.12–1.17 (M 1.15), PW/PA 1.18–1.26 (M 1.24), PW/PB 1.18–1.28 (M 1.23), PB/PA 0.96–1.05 (M 1.01); sides gently arcuate in front, very slightly sinuate at about three-tenths from base; front angles less sharply produced forwards than in *S. kadanus*; base bisinuate lobed, slightly emarginate at middle; hind angles subrectangular and minutely denticulate laterad at the corners; disc as in *S. kadanus*.

Elytra similar to those of *S. kadanus*, more parallel-sided than in *S. ohtanii*, widest at about middle; EW/PW 2.32–2.42 (M 2.37), EL/EW 1.47–1.58 (M 1.52); shoulders square, salient, and more or less reflexed; prehumeral borders short and al-

most perpendicular to the mid-line; humeral borders distinctly serrate, each bearing five to seven teeth, of which the median three or four are larger than the others; sides nearly straight behind shoulders, then feebly arcuate to near apices, which are separately rounded, forming an obtuse re-entrant angle at the suture; striation and chaetotaxy as in *S. kadanus*. Legs as in *S. kadanus*.

Male genital organ small and moderately sclerotized, generally similar to that of *S. ohtanii*, but different in the configuration of apical lobe. Aedeagus about two-sevenths as long as elytra, tubular, moderately arcuate, strongly curved at basal part, which bears a well developed sagittal aileron, and curved sigmoidally in dorsal view; basal orifice rather small, with the sides shallowly emarginate; dorsal margin semicircularly rounded in profile; apical orifice fairly large, whose left wall is slightly re-



Figs. 1–2. *Stygiotrechus* spp., ♂, dorsal views: *S. misatonis* from Mt. Onji-yama in Misato-chô (1); *S. itoi* from Mt. Ikoma-yama in Higashi-osaka-shi (2).

duced; apical part obliquely produced ventro-apicad; in most individuals the apical lobe slightly curved ventrad unlike that of *S. kadanus*; apical tip thinner than that of *S. ohtanii* though less sharp than in *S. kadanus*; viewed dorsally, apical lobe gradually narrowed towards apex, whose tip is rounded. Inner sac armed with an elongate copulatory piece, which is rolled ventrally, with the surface covered with scales. Styles fairly broad; left style longer and broader than the right, each provided with four apical setae.

Type series. Holotype: ♂, 19-IV-1998, H. ASHIDA leg. Paratypes: 8♂♂, 9♀♀, 19-IV-1998, K. KITAYAMA & H. ASHIDA leg.; 1♂, 1♀, 29-IV-1998, K. KAMADA & K. KITAYAMA leg.; 2♂♂, 1♀, 17-V-1998, H. ASHIDA leg.; 1♂, 2♀♀, 21-XI-1998, A. KITAYAMA & K. KITAYAMA leg.; 5♂♂, 1♀, 3-IV-1999, Y. OKUDA & H. ÔHIRA leg. The holotype is preserved in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Type locality. The southern slope (alt. 300 m) of Mt. Onji-yama (530 m in height), Misato-chô, Wakayama Prefecture, Central Japan.

Notes. To obtain additional specimens of *Trechima reductoculatus* S. UÊNO, 1992, we visited Misato-chô, in which lies the type locality of this anophthalmic trechine beetle, and unexpectedly found *S. misatonis* from a small dried gully in the cryptomeria plantation. *Stygiotrechus misatonis* crawled among humid clayey gravel at the depth of about 10–30 cm below the surface. *Trechima reductoculatus*, which prefers more humid habitat, was not found in this gully. The type locality of *S. misatonis* is on the drainage of the Kishi-gawa River, one of the tributaries of the Ki-no-kawa River, and is 20 km distant from the seashore in a beeline. It is 30 km distant to the northeast from Gonji-ana Cave/Mine, the type locality of *S. nishikawai*; 33 km to the southeast from Mt. Takamori-yama, the type locality of *S. kadanus*; 38 km to the southwest from Mt. Kongô-zan, the type locality of *S. ohtanii* (Fig. 7).

As was already mentioned in the introduction, *S. misatonis* is the second *Stygiotrechus* species from the south of the Median Tectonic Zone. UÊNO (1980) speculated in the description of *S. nishikawai* which is the first species from the south, that there were two possible ways of immigration to the south of the Ki-no-kawa Valley; namely by tidal current from the mouth of the Ki-no-kawa River to the southward direction, or by directly crossing the Ki-no-kawa Valley. The present finding strongly suggests that the latter hypothesis should be correct because Misato-chô is far from the shore and is in the different drainage from that of the Hidaka-gawa River in which lies the type locality of *S. nishikawai*.

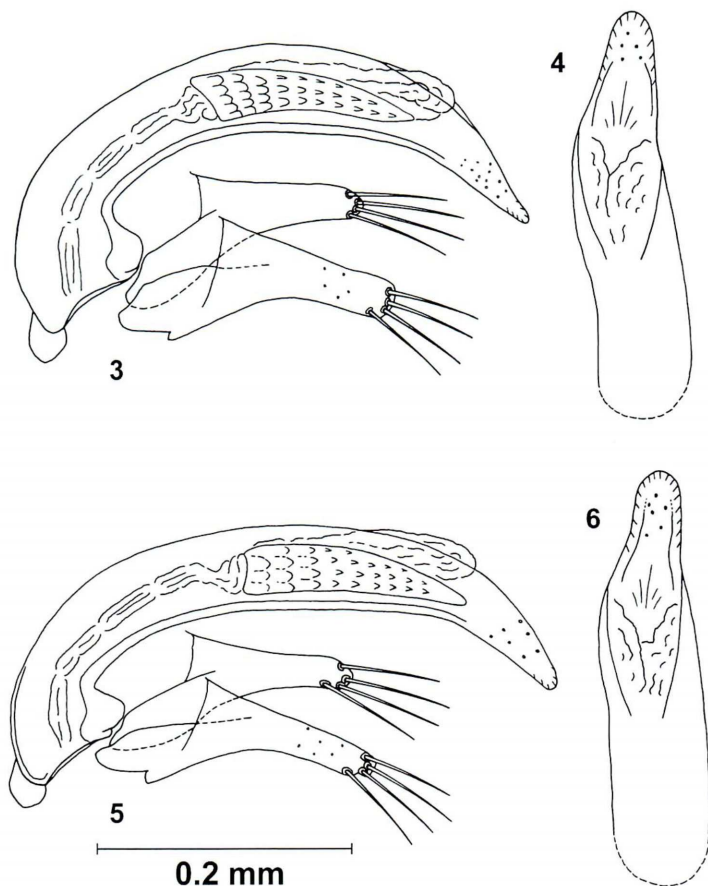
***Stygiotrechus itoi* ASHIDA et K. KITAYAMA, sp. nov.**

[Japanese name: Ikoma-mekura-chibigomimushi]

(Figs. 2, 5–6)

Stygiotrechus sp.: ASHIDA, 2000, Checklist of Trechinae from Japan, Kyoto, vers. VIII, p. 24.

Length: 2.35–2.65 mm (from apical margin of clypeus to apices of elytra).



Figs. 3–6. Male genitalia of *Stygiotrechus* spp.; left lateral view (3, 5), apical part of aedeagus, dorso-apical view (4, 6). — 3–4. *S. misatonis* from Mt. Onji-yama. — 5–6. *S. itoi* from Mt. Ikoma-yama.

Allied to *S. ohtanii* S. UENO from Mt. Kongô-zan though clearly distinguished from the latter species by larger fore-body, slenderer and more parallel-sided hind-body with salient shoulders, and the configuration of male genital organ with longer apical lobe of aedeagus.

Body smaller on an average, much slenderer, and somewhat more depressed than in *S. ohtanii*. Coloration as in *S. ohtanii*.

Head as in *S. ohtanii* though the genae are more distinctly subangulate at the posterior parts; antennae a little thinner, especially in segments 9–11; mouthparts as in *T. ohtanii*.

Pronotum a little wider on an average than in *S. ohtanii*, usually widest at about five-sevenths from base; PW/HW 1.19–1.29 (M 1.25), PW/PL 1.13–1.19 (M 1.17),

PW/PA 1.19–1.25 (M 1.21), PW/PB 1.19–1.27 (M 1.24), PB/PA 0.96–1.00 (M 0.98); front angles more sharply produced forwards than in *S. ohtanii* though less protruding than in *S. kadanus*; sides feebly arcuate in front, hardly sinuate in basal halves; hind angles obtuse and minutely denticulate laterad at the corners; base more distinctly lobed than in *S. ohtanii* and sometimes bisinuate; disc less convex than in *S. ohtanii*.

Elytra more parallel-sided and less ample than in *S. ohtanii*, widest at about middle; EW/PW 1.20–1.28 (M 1.23), EL/PL 2.29–2.45 (M 2.37), EL/EW 1.59–1.71 (M 1.65); shoulders square, obviously more salient than in all the members of the *S. ohtanii* group, and moderately reflexed; humeral borders distinctly serrate, each bearing four to five teeth, of which the median two or three are larger than the others; dorsum less convex, and more distinctly depressed in basal area than in *S. ohtanii*; striation and chaetotaxy as in *S. ohtanii*. Legs as in *S. ohtanii*, though somewhat slenderer.

Male genital organ lightly sclerotized, generally similar to that of *S. ohtanii*, but clearly different in the configuration of the apical lobe of aedeagus. Aedeagus about three-tenths as long as elytra, tubular, somewhat depressed, regularly arcuate in profile, and less sigmoidally curved in dorsal view than in *S. ohtanii*; basal orifice small, with the sides only shallowly emarginate; sagittal aileron fairly large; viewed laterally, apical lobe longer than in *S. ohtanii* and lightly curved ventrad; viewed dorsally, apical lobe elongate and somewhat asymmetrical; apical tip widely rounded. Copulatory piece a little shorter than in *S. ohtanii*, two-fifths as long as aedeagus, though similarly shaped and similarly covered with scales. Styles slenderer at the apical parts than in *S. ohtanii*; left style longer than the right, each bearing four apical setae.

Type series. Holotype: ♂, 17-X-1999, K. ITÔ leg. Paratypes: 1♂, 1♀, 17-X-1999, K. ITÔ leg.; 2♂♂, 30-X-1999, T. SAITÔ leg.; 2♂♂, 4♀♀, 31-X-1999, K. ITÔ, Y. OKUDA & S. YAMASHITA leg.; 2♀♀, 3-XI-1999, K. KITAYAMA leg.; 1♂, 22-X-2000, K. ITÔ leg.; 2♀♀, 13-I-2002, K. KITAYAMA & H. ASHIDA leg.; 1♂, 2-XII-2002, T. SAITÔ leg. The holotype is preserved in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Type locality. Hiraoka (alt. 150 m), the western foot of Mt. Ikoma-yama (642 m in height), Higashi-osaka-shi, Osaka Prefecture, Central Japan.

Notes. It was one of the most unexpected discoveries that *Stygiotrechus* was found from the Ikoma Hills, because this area is covered almost all over by granite that is unfavorable for endogean trechine beetles. Just before this discovery was made, we surveyed the hill area of Mt. Ikoma-yama, but we were unable to find *Stygiotrechus*. Mr. K. ITÔ searched for it around the lower area of the same mountain and successfully found *S. itoi*. The valley from where the present species was found is also granitic though containing some clayey soil. At first the present species was found from the undersurface of an embedded stone, and then several additional specimens were collected from deeper part at the depth of 30–50 cm.

Hiraoka, the type locality of this new species, is about 30 km distant to the north from Mt. Kongô-zan, that of *S. ohtanii*, and is at present the northernmost known locality of the group of *S. ohtanii* from the Kii Peninsula (Fig. 7). It is rather near to the

distributional range of the group of *S. morimotoi*, though there is the Yodo-gawa alluvion between the ranges of the two groups. Hiraoka is 25 km distant to the southeast from Minoo, the southernmost known locality of *S. morimotoi morimotoi* UENO (K. KITAYAMA & ASHIDA, 1999) and 29 km south of Izuriha, the type locality of *S. morimotoi notarum* UENO, 1980.

***Stygiotrechus ohtanii* S. UENO, 1969**

Stygiotrechus ohtanii S. UENO, 1969, Bull. natn. Sci. Mus., Tokyo, **12**, pp. 490, 491, fig. 5; type locality: Mt. Kongô-zan; 1973, Bull. natn. Sci. Mus., Tokyo, **16**, p. 29; 1980, J. speleol. Soc. Japan, **5**, p. 10; 2001, Elytra, Tokyo, **29**, p. 241, figs. 4–5. — K. KITAYAMA & ASHIDA, 1999, Nejirebane, Osaka, (85), p. 13, fig. 9. — ASHIDA, 2000, Checklist of Trechinae from Japan, Kyoto, vers. VIII, p. 24.

Additional records. 1♂, 2♀♀, 3–X–1999, K. ITÔ & S. YAMASHITA leg.; 1♀, 16–

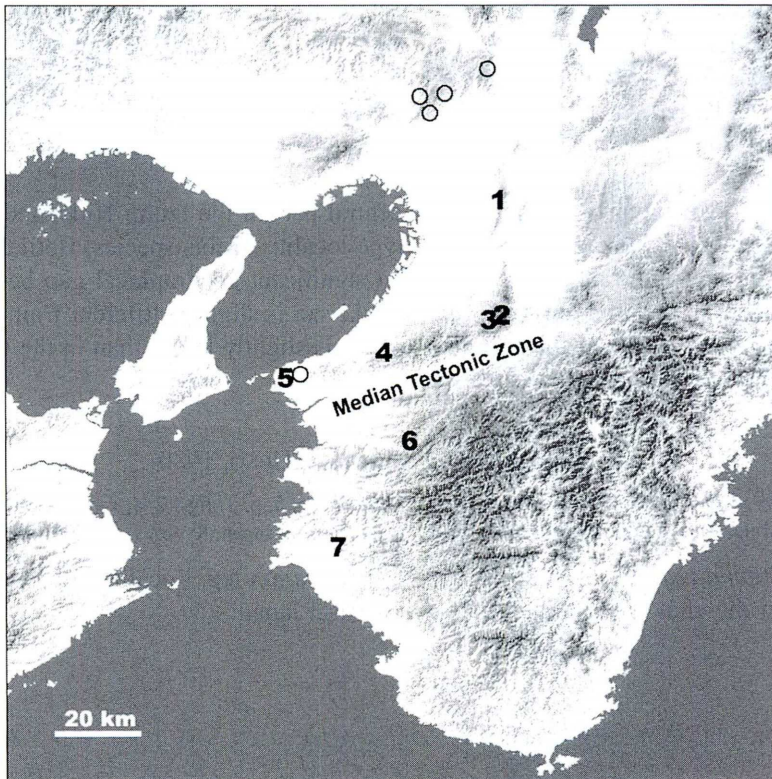


Fig. 7. Map showing the distribution of the group of *Stygiotrechus ohtanii*. — 1, *S. itoi* (Mt. Ikoma-yama in Higashi-osaka-shi); 2–3, *S. ohtanii* (Mt. Kongô-zan in Chihaya-akasaka-mura); 4, *S. kadanus* (Mt. Inunaki-san in Izumisano-shi); 5, *S. kadanus* (Mt. Takamori-yama in Wakayama-shi); 6, *S. misatonis* (Mt. Onji-yama in Misato-chô); 7, *S. nishikawai* (Gonji-ana Cave/Mine in Kawabe-chô); open circles, the group of *S. morimotoi*.

X-1999, K. KITAYAMA leg.; 1♀, 23-X-1999, K. KITAYAMA leg. Locality: the western slope (alt. 450 m) of Mt. Kongô-zan (1,112 m in height), Chihaya-akasaka-mura, Osaka Prefecture, Central Japan.

Notes. This species was recorded so far only from near the summit (about 1,000 m) of Mt. Kongô-zan. This is the first report of this species from the lower place. The spot is 1.5 km west of the type locality. The body proportion as well as the features of the male genitalia show no difference between the two populations.

Stygiotrechus kadanus S. UÉNO, 2001

Stygiotrechus kadanus S. UÉNO, 2001, Elytra, Tokyo, **29**, p. 234, figs. 1-3; type locality: Mt. Takamori-yama. — K. KITAYAMA & ASHIDA, 1999, Nejirebane, Osaka, (85), p. 13, fig. 10. — ASHIDA, 2000, Checklist of Trechinae from Japan, Kyoto, vers. VIII, p. 24.

Additional records. 1♀, 7-V-1998, K. KITAYAMA leg.; 2♂♂, 2♀♀, 3-X-1998, K. KITAYAMA leg.; 19♂♂, 13♀♀, 3-XI-1998, K. KITAYAMA & H. ASHIDA leg.; 1♂, 1♀, 17-I-1999, K. KITAYAMA & H. ASHIDA leg.; 3♀♀, 13-III-1999, T. SAITÔ & K. KITAYAMA leg.; 5♂♂, 3♀♀, 11-IV-1999, S. YAMASHITA & K. ITÔ leg.; 2♂♂, 3♀♀, 23-III-2002, K. KITAYAMA, H. KAMEZAWA & H. ASHIDA leg. Locality: Mt. Inunaki-san (alt. 370 m), southwest of Mt. Takashiro-yama (649 m in height), Izumisano-shi, Osaka Prefecture, Central Japan.

Notes. Mt. Inunaki-san lies on the central part of the Izumi Hills, and is 26 km east by north of Mt. Takamori-yama, the type locality of this species. Both the mountains are on the same range and there is no significant geographical gap between the two. Although the population from Mt. Inunaki-san is slightly different from the topotypical one in the shape of the pronotum which is slightly larger than in the latter, it is difficult to separate them even as subspecies.

Stygiotrechus nishikawai S. UÉNO, 1980

Stygiotrechus nishikawai S. UÉNO, 1980, J. speleol. Soc. Japan, **5**, p. 3, figs. 2-4; type locality: Gonji-ana Cave/Mine. — ASHIDA, 2000, Checklist of Trechinae from Japan, Kyoto, vers. VIII, p. 24.

Additional record. 1♂, 29-IV-1998, K. KAMADA leg. Locality: Gonji-ana Cave/Mine, Kawabe-chô, Wakayama Prefecture, Central Japan.

要 約

芦田 久・北山健司：紀伊半島のコンゴウメクラチビゴミムシ群。—— 紀伊半島から発見されたノコメクラチビゴミムシ属コンゴウメクラチビゴミムシ群に属する2新種を、ミサトメクラチビゴミムシ *Stygiotrechus misatonis* ASHIDA et K. KITAYAMA, sp. nov. およびイコマメクラチビゴミムシ *S. itoi* ASHIDA et K. KITAYAMA, sp. nov. と命名、記載した。前者は和歌山県美里町隠地山南麓で発見された種で、本属のうち中央構造線の南側から記載されたものとしては、ニシカワメクラチビゴミムシ *S. nishikawai* UÉNO に続く第2の種である。後者は大阪府東大阪市生駒山

西麓の枚岡で発見された種で、コンゴウメクラチビゴミムシ群の北限となる。本論文ではまた、既知種3種の追加記録を報告した。

References

- ASHIDA, H., 2000. Checklist of Trechinae from Japan. Version VIII. 29 pp. Kansai Trechine Research Group, Kyoto. (In Japanese, with English title.)
- KITAYAMA, K., & H. ASHIDA, 1999. Records of anophthalmic trechine beetles from Osaka Prefecture, Central Japan. *Nejirebane, Osaka*, (85): 10–13. (In Japanese, with English title.)
- UENO, S.-I., 1969. *Stygiotrechus* (Coleoptera, Trechinae), an assemblage of remarkably diversified blind trechines. *Bull. natn. Sci. Mus., Tokyo*, **12**: 485–515.
- 1970. The fauna of the insular lava caves in West Japan. III. Trechinae (Coleoptera). *Ibid.*, **13**: 603–622.
- 1973. A new endogean trechine beetle from Central Japan, with notes on the Japanese species of the *Stygiotrechus* complex. *Ibid.*, **16**: 23–30.
- 1976. Occurrence of *Stygiotrechus* (Coleoptera, Trechinae) in the Island of Shikoku, Japan. *Ibid.*, (A), **2**: 277–284.
- 1980. New *Stygiotrechus* (Coleoptera, Trechinae) from non-calcareous areas. *J. speleol. Soc. Japan*, **5**: 1–12.
- 1983. The anophthalmic trechine beetles from Takamatsu, Southwest Japan. *Bull. natn. Sci. Mus., Tokyo*, (A), **9**: 69–77.
- 1992. Two new upper hypogean *Trechiamma* (Coleoptera, Trechinae) of zoogeographical interest. *J. speleol. Soc. Japan*, **17**: 23–32.
- 2001. Two new *Stygiotrechus* (Coleoptera, Trechinae) on the verge of extinction. *Elytra, Tokyo*, **29**: 233–247.